

Illinois Commerce Commission

Assessment of

Mt. Carmel Public Utility Company's

Annual Reliability Report and

Electric Service Reliability

For Calendar Year 2006

Pursuant to 83 Ill. Adm. Code 411.140

December 2007

1. Executive Summary

Pursuant to Section 16-125 of the Illinois Public Utilities Act and the Commission's electric reliability rules found in 83 Illinois Administrative Code, Part 411 ("Part 411"), Mt. Carmel Public Utility Company ("MCPU") filed its annual electric reliability report for the 2006 calendar year. MCPU's report fully complied with Part 411 reporting requirements.

During 2006, MCPU's SAIFI of 1.90 was equal to the average of the SAIFI values reported by the other utilities, while its CAIFI of 1.94 was the lowest (best) out of six reporting utilities. These two system indices indicate that, on average, MCPU's customers experienced more interruptions in 2006 than in 2005, which is true for all the utilities reporting. MCPU's relatively low CAIFI indicates, in general, that different interruption events on MCPU's system were more likely to affect different customers. MCPU's system customer average interruption duration index ("CAIDI") of 224 minutes indicates that, during 2006, MCPU's customers that experienced interruptions were, on average, without electricity for about 3.7 hours during each interruption.

In July of 2007 Staff inspected three of MCPU's distribution circuits that during the 2006 calendar year had higher SAIFI values than MCPU's system SAIFI value. Staff found that MCPU's distribution facilities were generally in very good shape. However, Staff observed severely locations where trees were contacting or close to the primary conductor.

After reviewing MCPU's reliability report and inspecting its circuits, Staff recommends that MCPU:

- Continue with its efforts to install animal protection on distribution equipment. Animals continue to be a frequently occurring interruption cause within MCPU's service territory.
- Do a better job clearing trees away from the conductor on its distribution circuits so that the trees will not grow or blow into the lines prior to being trimmed again. Staff noted several locations on each circuit it inspected where trees were contacting or would soon be contacting the primary conductor.
- Consider utilizing overhead fault indicators on circuits that have line sections that disappear into rear lot easements or across fields, such as Circuit 31000. These devices could help MCPU find the cause of interruptions faster, thereby reducing CAIDI.

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2. Introduction

This document assesses the reliability report that Mt. Carmel Public Utility Company ("MCPU") filed covering the 2006 calendar year, and evaluates MCPU's reliability performance for that year.

83 Illinois Administrative Code Part 411.140 requires the Commission to assess the annual reliability report of each jurisdictional entity and evaluate the entity's reliability performance. Code Part 411.140 requires the Commission evaluation to:

- A) Assess the reliability report of each entity.
- B) Assess the jurisdictional entity's historical performance relative to established reliability targets.
- C) Identify trends in the jurisdictional entity's reliability performance.
- D) Evaluate the jurisdictional entity's plan to maintain or improve reliability.
- E) Identify, assess, and make recommendations pertaining to any potential reliability problems and risks that the Commission has identified as a result of its evaluation.
- F) Include a review of the jurisdictional entity's implementation of its plan for the previous reporting period.

3. Customers and Service Territory

MCPU provided electric service to approximately 5,770 customers during 2006. MCPU's service territory in southeastern Illinois covers approximately 107 square miles and includes the community of Mt. Carmel and adjacent rural areas.

4. Description of Distribution System

During 2006, MCPU's distribution system was made up of three distribution substations and twelve distribution circuits. MCPU expects to place a fourth distribution substation in service in the very near future. MCPU supplies its distribution customers with approximately 266 circuit miles of distribution facilities: all but approximately 2.7% of these distribution facilities are overhead. There are two separate transmission sources operated by AmerenCIPS that supply MCPU's distribution system. MCPU receives 138 kV from AmerenCIPS in Albion, to the west of Mt. Carmel, and receives 69 kV from AmerenCIPS in Lawrenceville, to the north of Mt. Carmel. MCPU supplies four industrial/wholesale substations.

Subsection 411.120(b)(3)(G) requires MCPU to report on the age and condition of its distribution and transmission facilities. MCPU reported the average age of its distribution facilities is 23 years, with an average remaining life of 7 years. MCPU reported the average age of its transmission facilities is 22 years, with an average remaining life of 8 years.

MCPU stated that it inspects and maintains its facilities on a regular basis, and in addition has implemented reliability enhancement programs. Based on its reliability indices and the results of the customer satisfaction survey, MCPU concluded its

facilities are in good operating condition and provide customers with safe and reliable service.

5. Assessment of Company's Reliability Report

83 Illinois Administrative Code Part 411.120(b) requires each non-exempt jurisdictional entity to file an annual reliability report for the previous calendar year by June 1 of the current year. MCPU's 2006 reliability report was filed on time and contained all the information necessary to comply with Subsection 411.120(b)(3) requirements. Staff found that MCPU's reliability report was organized in a logical manner.

6. Historical Performance Relative to Established Reliability Targets

Code Part 411.140(b)(4)(A-C) establishes electric service reliability targets that jurisdictional entities (utilities) must strive to meet. These targets specify limitations on customer interruptions as well as hours of interruption that a utility must strive not to exceed on a per customer basis. Code Part 411.120(b)(3)(L) requires each utility to provide a list of every customer, identified by a unique number, who experienced interruptions in excess of the service reliability targets, the number of interruptions and interruption duration experienced in each of the three preceding years, and the number of consecutive years in which the customer has experienced interruptions in excess of the service reliability targets.

In April 2004, all regulated Illinois electric utilities agreed to report on all interruptions (controllable and uncontrollable) in relation to the service reliability targets for the reporting periods of 2003 through 2007, and to include the specific actions, if any, that the utility plans or has taken to address the customer reliability concerns. The customer service reliability targets are listed in Table 1:

Table 1: Service Reliability Targets

Immediate primary source of service operation voltage	Maximum number of interruptions in each of the last three years	Maximum hours of total interruption duration in each of the last three years
69kV or above	3	9
Between 15kV & 69kV	4	12
15kV or below	6	18

In Attachment B to its 2006 Reliability Report MCPU indicated only one of its customers experienced interruptions in excess of the reliability targets. This was the first year MCPU reported any customers experienced interruptions in excess of the reliability targets. The effected customer, reported to be an oil well operation, experienced seven interruptions during 2004 and 2005, and ten in 2006. MCPU explained that a 1900 foot long tap supplies the customer, and that 12 of the 24 interruptions that this customer experienced during the previous three years were attributed to weather. MCPU plans to install lightning protection and perform other regular maintenance on the tap to this customer in an effort to reduce the number of interruptions that this customer experiences. Staff finds MCPU's response to be reasonable.

Subsection 411.140(b)(4)(D) requires the Commission's assessment to determine if MCPU has a process in place to identify, analyze, and correct service reliability for customers who experience a number or duration of interruptions that exceeds the reliability targets. It appears to Staff that MCPU does have such a process in place. Staff was pleased to learn MCPU has plans in place that should reduce the impact future storms will have on the service MCPU provides to this customer.

7. Analysis of Reliability Performance

Reliability indices can be used to compare the reliability performance of several utilities, and provide an indication of whether an individual utility's performance is improving or degrading over time. Since each reporting utility uses its own reporting and recording methods, direct reliability index comparisons between utilities are not exact, but can still be informative. When comparing the indices reported by all the utilities that filed reliability reports for 2006, Staff observed:

- MCPU's SAIFI of 1.90 was the 3rd highest reported for 2006: and equaled the average of the values reported by the other five utilities.
- MCPU's CAIDI of 224 was the third lowest reported for 2006: about 63% lower than the average of the values reported by the other five utilities.
- MCPU's CAIFI of 1.94 was the lowest reported for 2006: about 24% lower than the average of the values reported by the other five utilities.

Table 2 (a-c) shows the SAIFI, CAIDI, and CAIFI indices for 2006 as submitted by each reporting utility. Each index table is sorted from best to worst performance:

Table 2: Year 2006 Reliability Indices for Reporting Utilities

a) SAIFI

UTILITY	SAIFI
ComEd	1.43
AmerenCILCO	1.61
MidAmerican	1.89
Mt. Carmel	1.90
AmerenCIPS	2.04
AmerenIP	2.53

$$\text{SAIFI} = \frac{\text{Total \# Customer Interruptions}}{\text{Total \# Customer Served}}$$

b) CAIDI

UTILITY	CAIDI
MidAmerican	87
ComEd	149
Mt. Carmel	224
AmerenCILCO	489
AmerenCIPS	754
AmerenIP	1545

$$\text{CAIDI} = \frac{\text{Sum of all Interruption Durations}}{\text{Total \# Customer Interruptions}}$$

c) CAIFI

UTILITY	CAIFI
Mt. Carmel	1.94
ComEd	2.18
AmerenCILCO	2.37
MidAmerican	2.39
AmerenCIPS	2.68
AmerenIP	3.07

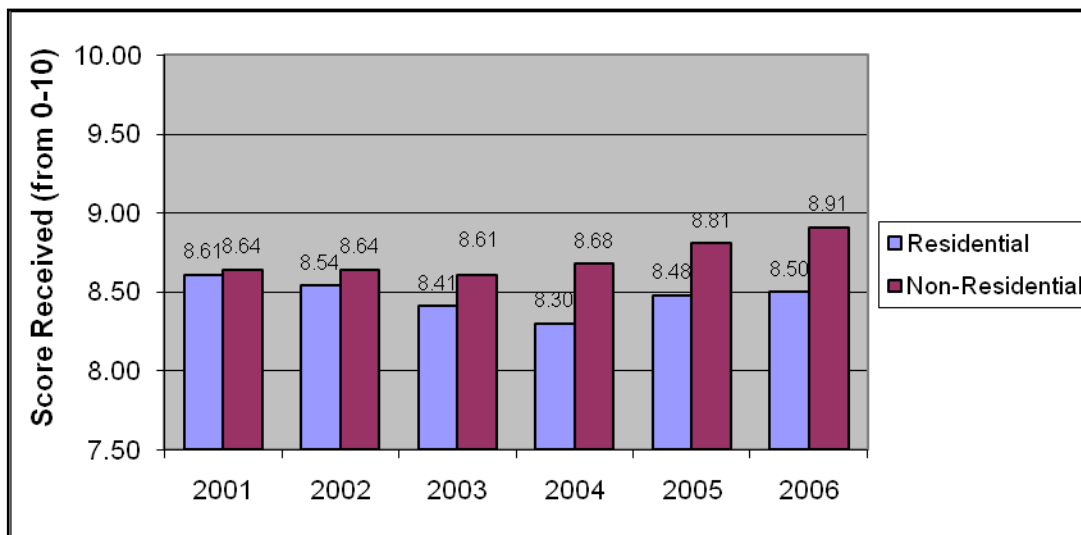
$$\text{CAIFI} = \frac{\text{Total \# Customer Interruptions}}{\text{Total \# Customers Affected}}$$

MCPU stated it had no customers receiving power from another utility or ARES during 2006. Therefore a comparison of interruption frequency and duration for MCPU's customers buying from MCPU versus buying from another utility or ARES is not possible.

Independent survey results indicate that for 2006, MCPU's residential customers gave MCPU a reliability score of 8.50 out of 10, and its non-residential customers gave

MCPU a reliability score of 8.91 out of 10. These scores have been improving for MCPU in recent years, as illustrated by Figure 1:

Figure 1: MCPU's Survey Score for Providing Reliable Electric Service (2001-2006)



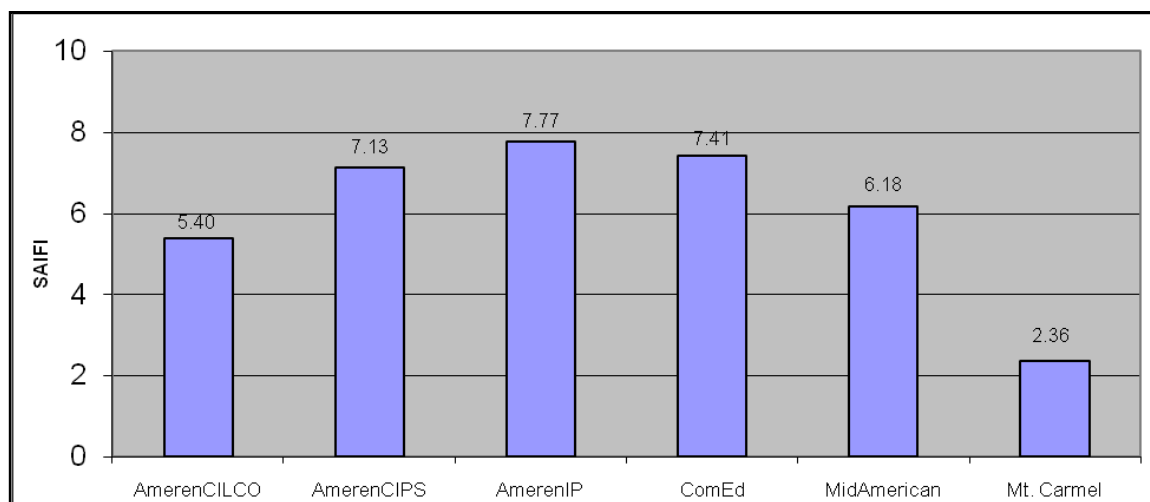
Worst Performing Circuits

Section 411.120 requires utilities to report worst performing circuits and state corrective actions taken or planned to improve the performance of those circuits. Worst performing circuits for each reporting utility are its 1% of circuits that had the highest SAIFI, CAIDI, and CAIFI during the report year. MCPU reported only 2 circuits as worst performing circuits during 2006 because the same circuit (Circuit 31000) was MCPU's worst performing circuit for both SAIFI and CAIFI.

A utility must report worst performing circuits even if all its circuits performed well during the year: the Part 411 requirement is simply that the utility report its circuits that performed the worst based on each reliability index. Since designating a circuit as a worst performing circuit does not necessarily indicate that the circuit performed poorly, comparing the index values for worst-case circuits from utility to utility can be useful when assessing the relative performance of circuits among several utilities.

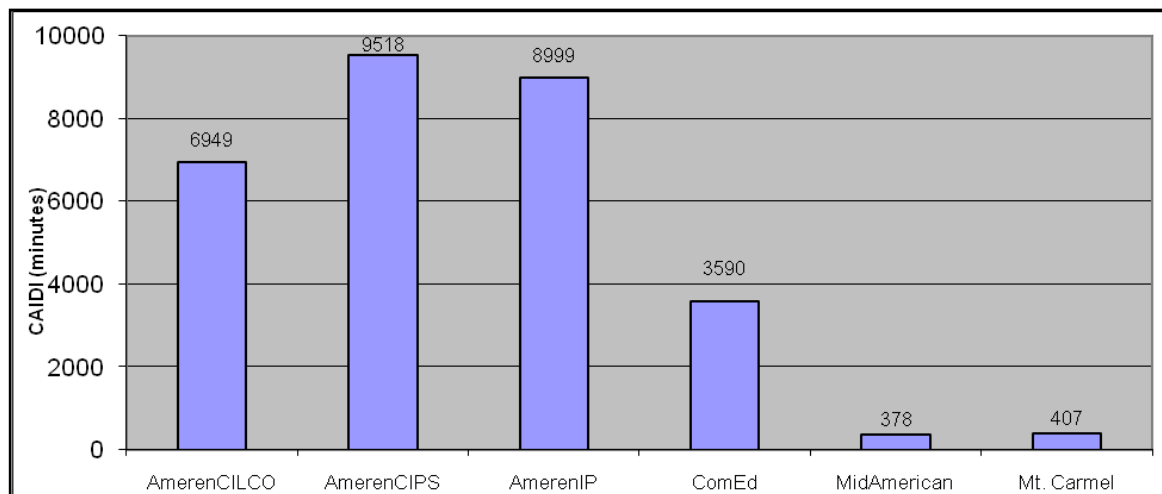
- Figure 2 shows the highest value of SAIFI each utility reported for an individual distribution circuit for the 2006 calendar year. The values reported by the utilities ranged from 2.36 at MCPU to 7.77 at AmerenIP. The SAIFI of 2.36 that MCPU reported for Circuit 31000 was the lowest of the values any of the utilities reported for a circuit that was worst performing due to SAIFI.

Figure 2: Highest SAIFI for 2006 Worst Performing Circuits Reported by each Utility



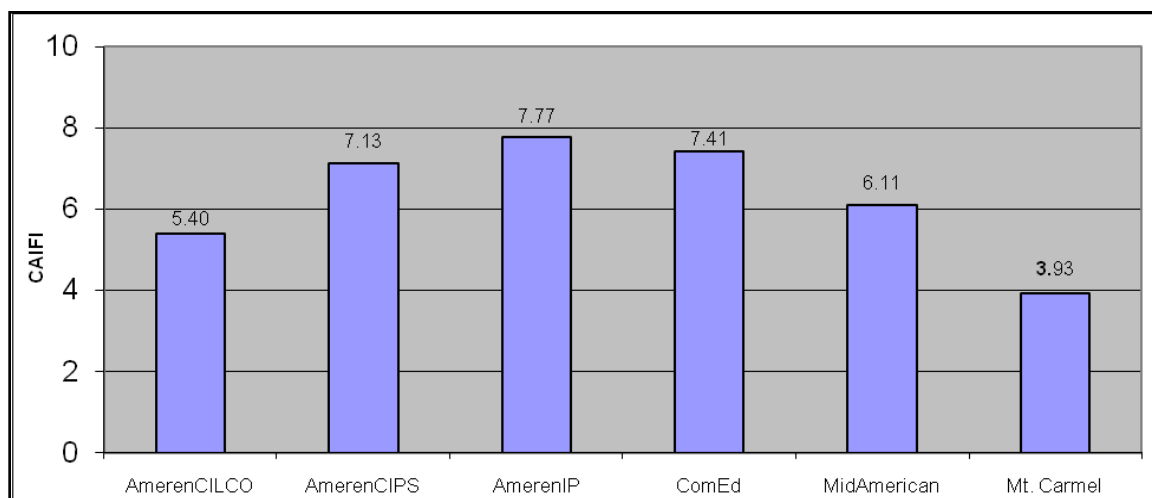
- Figure 3 shows the highest value of CAIDI each utility reported for an individual distribution circuit for the 2006 calendar year. The values reported by the utilities ranged from 378 at MidAmerican Energy Company to 9518 at AmerenCIPS. The value of 407 that MCPU reported for Circuit 32000 was the second lowest of the values the utilities reported for a circuit that was worst performing due to CAIDI.

Figure 3: Highest CAIDI for 2006 Worst Performing Circuits



- Figure 4 shows the highest value of CAIFI each utility reported for an individual distribution circuit for the 2006 calendar year. The values reported by the utilities ranged from 3.93 at MCPU to 7.77 at AmerenIP. The value of 3.93 that MCPU reported for Circuit 31000 was the lowest of the values any of the utilities reported for a circuit that was worst performing due to CAIFI.

Figure 4: Highest CAIFI for 2006 Worst Performing Circuits



In summary, most utilities report a wide range of reliability statistics for customers, depending on the performance of the distribution circuits that supply them. In general, MCPU's worst performing circuits performed better than the worst performing circuits of the other utilities.

MCPU included statements in its reliability report regarding the operating and maintenance history of the 2 circuits it designated as worst performing circuits, Circuit 31000 and Circuit 32000, and listed corrective actions, taken or planned for these circuits:

MCPU reported there were 91 outage events on Circuit 31000 during 2006, causing it to be a worst performing circuit due to both SAIFI and CAIFI. Approximately 41% of these events were weather related, 26% overhead equipment related, and 14% animal related. MCPU stated it inspected Circuit 31000 during 2006, and issued work orders to repair defects found during the inspection, including the replacement of several poles and cross arms. MCPU also stated it performed tree trimming on approximately 35% of the circuit during 2006. MCPU plans no additional corrective action beyond normal maintenance. Staff supports MCPU's actions to inspect Circuit 31000 with follow-up work orders to correct problems found during the inspection. Staff's only suggestion is that MCPU act promptly to complete its work so that customers do not experience interruptions that would have been avoided had the work been completed more promptly.

Circuit 32000 was MCPU's worst performing circuit during 2006 due to CAIDI. During 2006, on average, the customers who are supplied by Circuit 32000 that experienced service interruptions during the year were without service for between six and seven hours during each interruption. This is longer than MCPU's system average of 3.7 hours, but shorter than customers supplied from the worst performing circuits of most of the other reporting utilities. MCPU stated 17 outages occurred on Circuit 32000 during 2006. MCPU attributed six of these to weather, six to overhead equipment failures, and two to unknown causes. Similar to Circuit 31000, MCPU stated it inspected Circuit 32000 during 2006 and issued work orders to make repairs on defects found. MCPU also completed tree trimming on approximately 35% of this circuit during 2006. MCPU

replaced several lightning arresters, cross arms, and a few poles. MCPU stated it plans no additional corrective action beyond continued normal maintenance. Again, Staff is pleased with MCPU's actions to inspect its worst performing circuit and develop work orders to repair the items it found during the inspection.

Staff believes MCPU's inspection and follow-up repair to maintain and/or improve reliability on these two circuits was appropriate. Even though 91 interruptions on Circuit 31000 is a high number, Staff found when inspecting this circuit that MCPU appears to have effectively utilized tap fusing to minimize the number of customers affected by each event.

Staff's Circuit Inspections

During July of 2007, Staff inspected three of MCPU's distribution circuits that had higher than average SAIFI indices during 2006: Circuit 13000, Circuit 14000, and Circuit 31000. A MCPU representative accompanied Staff during the inspections. The most frequent problem Staff observed during the inspections was trees contacting or close to the primary conductor. Other than these tree contacts, Staff found that MCPU's facilities were in very good condition. Staff sent a list of its inspection findings on July 26, 2007 (see Attachment A). Staff was quite pleased that on August 22, 2007, MCPU notified Staff it had corrected all the locations Staff included on that list. Additional information regarding each of the circuits that Staff inspected follows:

- *Circuit 13000 (12 kV): (SAIFI=2.15; CAIDI=110; CAIFI=2.18)*

Circuit 13000 is a fairly short urban circuit that supplies electricity to approximately 340 customers within the community of Mt. Carmel. Much of the circuit is attached to poles that also support Circuit 14000. Circuit 13000 was not reported as a worst performing circuit during 2006, but had SAIFI and CAIFI values that were somewhat higher than MCPU's system SAIFI and CAIFI values of 1.90 and 1.94, respectively. Of the 7 interruptions that occurred on Circuit 13000 during 2006, MCPU reported that 4 were weather related, 2 were due to overhead equipment, and one was tree related.

MCPU trims its trees according to a grid pattern laid over its operating area, rather than by circuit, so that parts of Circuit 13000 were last trimmed in 2004, and parts in 2005. MCPU most recently completed its own inspection of this circuit in October of 2006, and found no major defects during that inspection. MCPU reported that there was no improvement work in progress or planned.

During its 2007 inspection Staff noted four locations where new growth on trees was contacting or close to MCPU's primary conductor, but observed no other reliability threats. In an August 22, 2007 email, MCPU informed Staff that it had completed trimming the trees that Staff had noted during its inspection, and Staff was quite pleased with MCPU's prompt response.

- *Circuit 14000 (12 kV): (SAIFI=2.05; CAIDI=34; CAIFI=2.11)*

Circuit 14000 supplies electricity to about 475 customers within the community of Mt. Carmel. Like Circuit 13000, this circuit was not a worst performing circuit, but during 2006 had a SAIFI higher than MCPU's system average. MCPU reported 9

sustained interruptions on this circuit during 2006: 3 were weather related; 2 were attributed to trees; 2 were attributed to overhead equipment; one was attributed to employee error, and one to an animal.

MCPU most recently completed tree trimming on various parts of Circuit 14000 in 2004 and 2005. MCPU most recently completed its own inspection of this circuit in October of 2006, and found no major defects during that inspection. MCPU reported that, other than one relocation necessitated by new construction, there was no improvement work in progress or planned.

When inspecting Circuit 14000, Staff noted six locations where new tree growth was close to or contacting MCPU's primary conductor. Staff observed no other reliability threats. As previously stated, MCPU informed Staff that it has completed trimming the trees that Staff had noted.

- *Circuit 31000 (12 kV): (SAIFI=2.36; CAIDI=91; CAIFI=3.93)*

Circuit 31000 extends to the south and west of Mt. Carmel into the rural areas of Wabash County, supplying about 870 customers. Circuit 31000 is much longer than the other two circuits that Staff inspected, and was MCPU's worst performing circuit for both SAIFI and CAIFI. Of the 91 interruptions on this circuit during 2006, MCPU reported 37 were weather related, 24 were due to overhead equipment, 13 were animal related, and 8 were due to unknown causes.

MCPU most recently completed trimming trees growing adjacent to Circuit 31000 in 2005 and 2006. MCPU most recently completed an inspection of this circuit between July and November of 2006. MCPU completed several improvements as a result of its inspection, including replacing several poles and cross arms. The most significant improvement that MCPU plans for Circuit 31000 is to split the circuit and supply the western part from its new West 3rd Street Substation. MCPU anticipates this work will be completed in the 2007-2008 timeframe.

When inspecting Circuit 31000, Staff noted 20 locations where vegetation in the form of recent tree growth or fast-growing vines, was close to or contacting the primary conductor. Staff also noted two locations with loose hardware, and one location with a National Electrical Safety Code ("NESC") violation where MCPU used single, rather than double, cross arms at a railroad crossing. Circuit 31000 is quite lengthy, with several line sections traversing fields where the conductor is not visible. Overall, Staff found that the condition of MCPU's distribution facilities was quite good. Staff encourages MCPU to schedule mid-cycle tree trimming if MCPU is unable to trim in such a manner that the trees and/or vines do not contact the conductor between cycles. In addition, to aid in locating and isolating future circuit problems, Staff suggests that MCPU consider installing overhead fault indicators where the circuit leaves the roadway to traverse fields or back lots, and where the line again becomes visible.

Photo 1: Vegetation covering transformer (31000)



Tree Trimming:

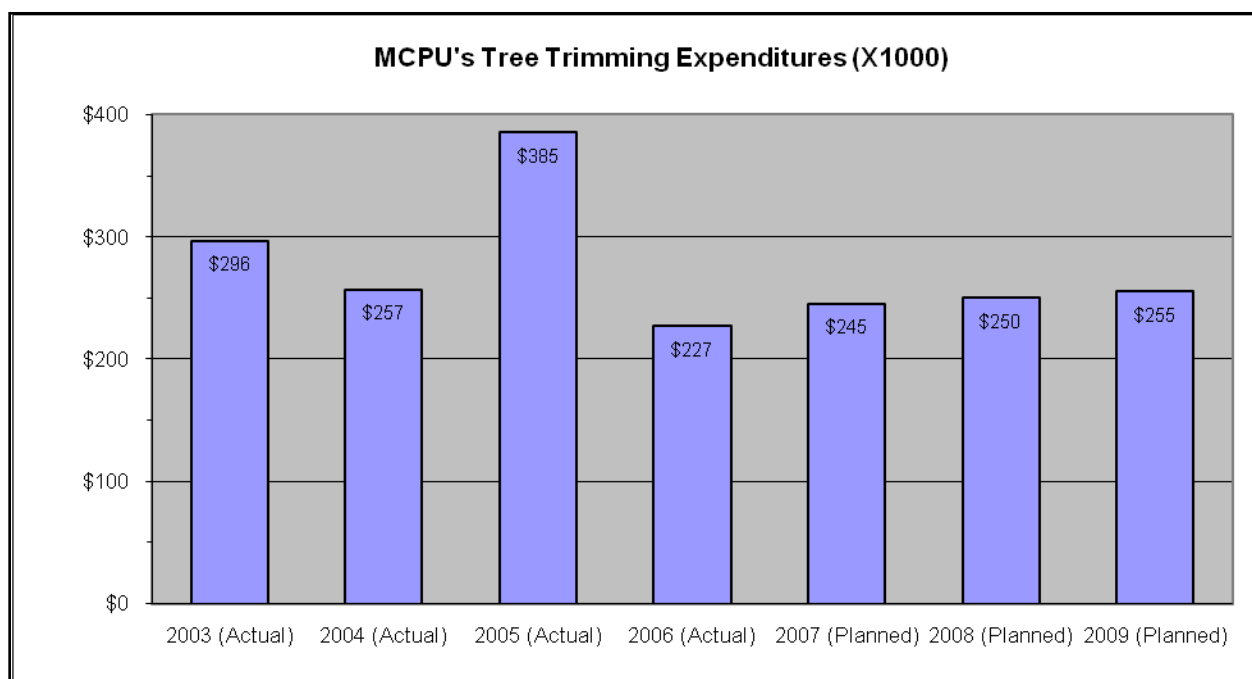
For trimming trees, MCPU divides its operating area into a grid, and then schedules tree trimming within each grid on a three year cycle. Line sections of MCPU's individual circuits typically lie within more than one geographic grid, so that parts of the same circuit can and often do lie in grids that are scheduled for tree trimming in different years. MCPU committed to trim trees that grow adjacent to its distribution circuits on a three year cycle, and has only recently completed its first full three-year cycle. During Staff's inspections in July of 2007, Staff noted several trees close to or contacting each of the distribution circuits Staff inspected. Staff believes MCPU will need to trim some of these trees more aggressively or more frequently in order to maintain its three year grid cycle to adequately prevent and eliminate tree contacts.

MCPU indicated its customers experienced 46 tree related interruptions during 2006, which is approximately 53% more than the 30 tree related interruptions MCPU reported in 2005, and the highest number of tree related interruptions that MCPU has reported in recent years. Staff believes that interruptions categorized as "weather related" and/or "unknown" sometimes involve trees. MCPU's interruptions attributed to the combined categories of trees, weather, and unknown increased by approximately 80% from 2005 to 2006. This increase includes a 117% increase in the number of MCPU's interruptions categorized as weather related (from 76 in 2005, to 165 in 2006) and a 23% increase in the number of interruptions with a cause categorized as "unknown" (from 35 in 2005, to 43 in 2006). These statistics, combined with Staff's observations of tree contacts on the circuits Staff inspected, indicate to Staff that MCPU should strive to trim trees more effectively to reduce the number of interruptions to customers.

Figure 5 illustrates MCPU's actual annual expenditures for tree trimming for the years 2003 through 2006, and its budgeted/planned annual tree trimming expenditure for 2007-2009. All expenditures are shown in actual year dollars.

MCPU indicated it spent 41% less for distribution tree trimming during 2006 than during 2005, and about 5% less than the amount it had budgeted. Staff understands that MCPU's tree trimming expenditures were higher in 2005 because MCPU was catching-up in order to meet its commitment to trim trees on a 3-year cycle. MCPU indicated it did satisfy its commitment to complete trimming on 100% of its grids within the 3-years July 2004 to July 2007. As Figure 5 indicates, in future years MCPU anticipates fairly flat tree trimming expenditures.

Figure 5: MCPU's Distribution Tree Trimming Expenditures in Actual Dollars



Staff is pleased that MCPU trimmed all of its grids within a 3-year time period, but Staff does not see this achievement as an indication that MCPU is adequately trimming the trees that grow adjacent to its circuits. An effective tree trimming program keeps trees from contacting primary conductors. If MCPU is unable to keep trees cleared from its power lines with its existing 3-year tree trimming cycle, then Staff recommends MCPU establish a mid-cycle trimming program to address those fast-growing trees that require more frequent trimming. This action appears to Staff to be the logical next step to reduce the number of tree related interruptions to improve the reliability of the service MCPU provides to its customers.

8. Trends in Reliability Performance

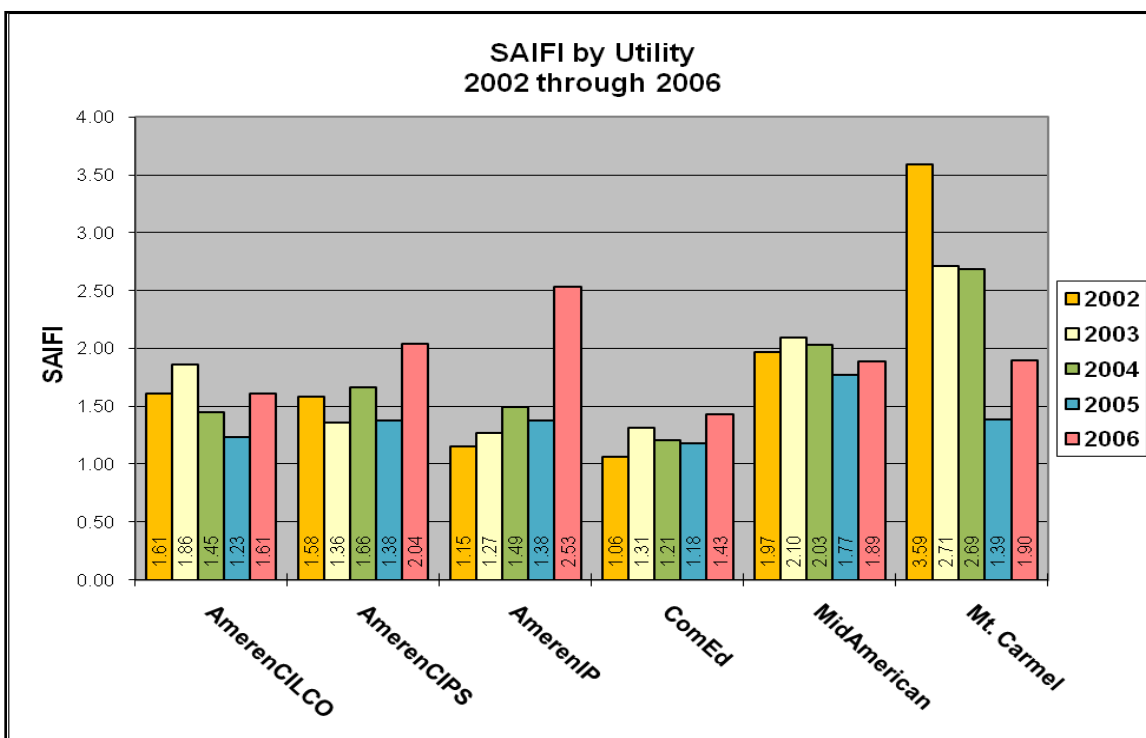
MCPU has reported reliability indices during the period 2002 to 2006 that vary considerably from year to year. One explanation for this variation is that storms can affect MCPU's system reliability statistics more than they affect the system reliability

statistics of utilities with a larger service area foot print. For utilities with larger service areas, each storm does not batter all parts of the utility's distribution system. For 2006, MCPU's SAIFI value was equal to the average value reported by all the utilities, and MCPU's CAIFI value was the lowest reported. MCPU's 2006 CAIDI indicates that, once interruptions occurred, MCPU, on average, restored service faster than the Ameren utilities, but not as fast as ComEd or MidAmerican Energy Company.

Six electric utilities filed reliability reports for the 2006 calendar year.¹ A comparison of MCPU's reliability indices to the reliability indices of all reporting utilities follows:

- *SAIFI*: Figure 6 shows system SAIFI values for years 2002-2006 for reporting electric utilities:

Figure 6: SAIFI by Utility



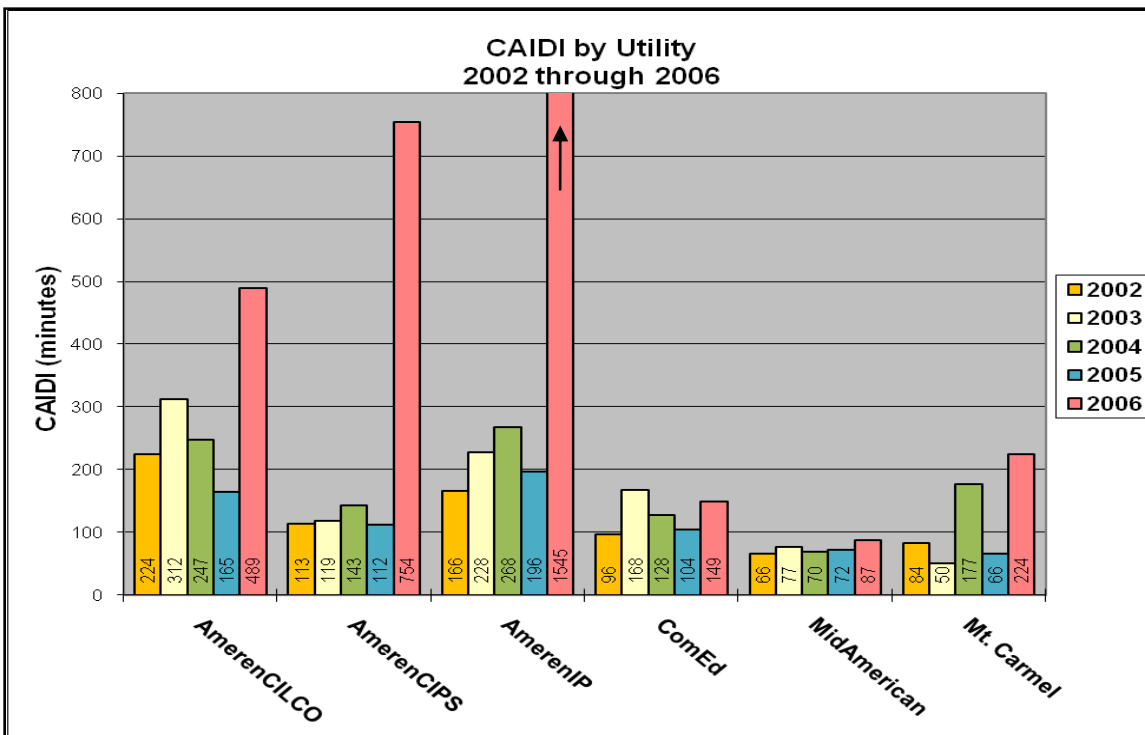
- In 2002, MCPU's SAIFI was the highest (worst) reported: about 153% higher than the average of SAIFI values reported by the other utilities (MCPU's 2002 SAIFI=3.59).
- In 2003, MCPU's SAIFI decreased (improved) by nearly 25%, but was still the highest reported: about 83% higher than the average of the SAIFI values reported by the other utilities (MCPU's 2003 SAIFI=2.71).
- In 2004, MCPU's SAIFI again decreased (improved), but by less than 1%, and was yet again the highest reported: nearly 100% higher than the average of the SAIFI values reported by the other utilities (MCPU's 2004 SAIFI=2.69).

¹ Statistics for AmerenUE, Interstate Power and Light, and South Beloit Water, Gas, and Electric Company, which no longer operate in Illinois, are included for the years in which they did operate and file reliability reports.

- In 2005, MCPU's SAIFI decreased (improved) by about 48%, so that MCPU's SAIFI was no longer the highest reported, but it was still about 20% above the average of SAIFI values the other utilities reported (MCPU's 2005 SAIFI=1.39).
- In 2006, MCPU's SAIFI increased (worsened) by about 37%, but two Ameren utilities reported higher values. MCPU's SAIFI equaled the average of the values reported (MCPU's 2006 SAIFI=1.90).

➤ **CAIDI:** Figure 7 shows system CAIDI values for years 2002-2006 for reporting electric utilities:

Figure 7: CAIDI by Utility

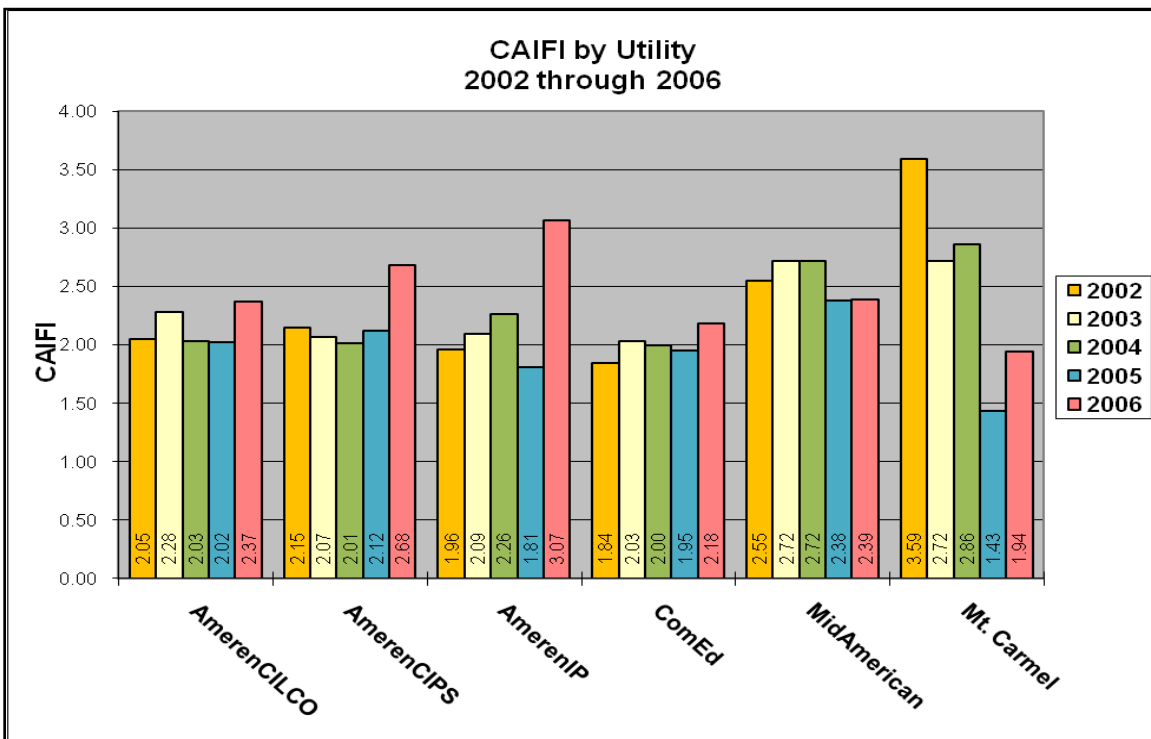


- In 2002, MCPU reported the second lowest (best) CAIDI: approximately 35% lower than the average of the CAIDI values of the other utilities that filed reliability reports (MCPU's 2002 CAIDI=84).
- In 2003, MCPU's CAIDI decreased (improved) by approximately 40%, and was again the second lowest value reported, about 71% lower than the average of the CAIDI values reported by the other utilities (MCPU's 2003 CAIDI=50).
- In 2004, MCPU's reported CAIDI increased (worsened) by approximately 254%, and was the fourth highest: about 8% higher than the average of the CAIDI values reported by the other reporting utilities (MCPU's 2004 CAIDI=177).
- In 2005, MCPU's CAIDI decreased (improved) by approximately 63%, and MCPU reported the lowest CAIDI value: 51% lower than the average of the CAIDI values of the other reporting utilities (MCPU's 2005 CAIDI=66).

- In 2006, MCPU's CAIDI increased (worsened) by about 239%, but the Ameren utilities reported even larger increases, so that MCPU's CAIDI was the third lowest reported: 63% below the average value of the other utilities that filed reliability reports.

➤ *CAIFI*: Figure 8 shows system CAIFI values for years 2002-2005 for reporting electric utilities:

Figure 8: CAIFI by Utility



- In 2002, MCPU's CAIFI was the highest (worst) reported, about 70% higher (worse) than the average of the CAIFI values reported by the other utilities (MCPU's 2002 CAIFI=3.59).
- In 2003, MCPU's CAIFI decreased (improved) by approximately 24%, but MCPU and MidAmerican Energy Company both reported the same highest (worst) value. MCPU's CAIFI was about 25% higher than the average of the CAIFI values reported by the other utilities (MCPU's 2003 CAIFI=2.72).
- In 2004, MCPU's CAIFI increased (worsened) by approximately 5% and was again the highest reported: about 45% higher (worse) than the average of the CAIFI values reported by the other reporting utilities (MCPU's 2004 CAIFI=2.86).
- In 2005, MCPU's CAIFI decreased (improved) by 50%, and MCPU reported the third lowest (best) CAIFI value, only slightly higher than the Alliant utilities (which no longer operate in Illinois). MCPU's CAIFI was 23% below the average of the CAIFI values of the other reporting utilities (MCPU's 2005 CAIFI=1.43).

- In 2006, the CAIFI value that MCPU reported was nearly 36% higher than its 2005 value, but other utilities reported even higher values, so that MCPU's CAIFI was the lowest (best) reported: about 24% below the average value reported by the other utilities (MCPU's 2006 CAIFI=1.94).

A comparison between the changes in MCPU's reliability indices from 2005 to 2006 to changes in the average of the indices from all the other reporting utilities for the same periods reveals:

- MCPU's SAIFI increased (worsened) by about 37%; the average of the SAIFI values of the other reporting utilities increased by about 67%.
- MCPU's CAIDI increased (worsened) by about 249%; the average of the CAIDI values of the other reporting utilities increased by about 348%.
- MCPU's CAIFI increased (worsened) by about 36%; the average of the CAIFI values of the other reporting utilities increased by about 37%.

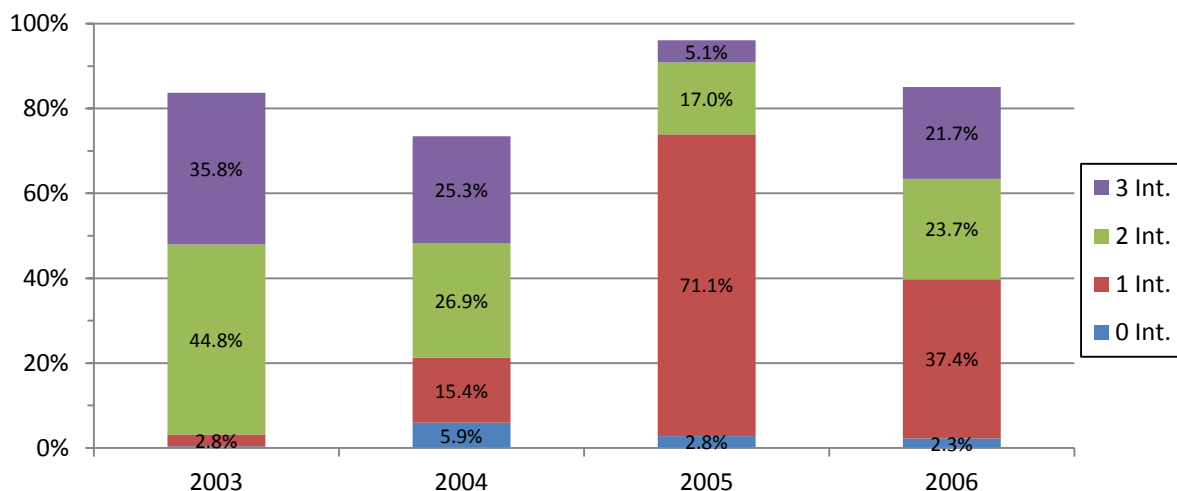
Interruptions to Individual Customers

MCPU's reliability report lists the number of customers that experienced various quantities of interruptions during the year.

- *Zero interruptions:* During 2006, 2.3% of MCPU's customers experienced zero interruptions. This value was 2.8% during 2005, 5.9% during 2004, and 0.4% during 2003.
- *3 or Fewer Interruptions:* During 2006, 85% of MCPU's customers experienced 3 or fewer interruptions. This value was 96% during 2005, 73% during 2004, and 84% during 2003.
- *7 or More Interruptions:* During 2006, 1.9% of MCPU's customer experienced 7 or more interruptions. This value was 0.1% during 2005, 1.5% during 2004, and 0.7% during 2003.

Figure 9 illustrates the percentage of MCPU's customers that experienced 3 or fewer interruptions during the years 2003 through 2006.

Figure 9: Percent of MCPU's Customers with 3 or Fewer Interruptions Annually (2003-2006)



Customer Interruption Cause Categories

Table 3 shows MCPU's interruptions for 2003-2006 attributed to the various interruption categories listed in Table-A of Part 411. There were more interruption events on MCPU's distribution system during 2006 than during any of the three previous years.

Table 3: MCPU's Interruptions by Cause for Calendar Years 2003 to 2006

Interruption Cause	2006		2005		2004		2003	
Weather	165	32.4%	76	22.4%	173	34.9%	62	20.0%
Overhead Equipment	78	15.3%	76	22.4%	73	14.7%	62	20.0%
Animal Related	60	11.8%	39	11.5%	70	14.1%	56	18.1%
Intentional\Maintenance	59	11.6%	44	13.0%	54	10.9%	17	5.5%
Tree Related	46	9.0%	30	8.8%	39	7.9%	41	13.2%
Unknown	43	8.4%	35	10.3%	44	8.9%	31	10.0%
Customer Equipment	38	7.5%	27	8.0%	24	4.8%	21	6.8%
Public	17	3.3%	11	3.2%	17	3.4%	18	5.8%
Employee\Contractor Personnel Errors	2	0.4%	0	0.0%	0	0.0%	1	0.3%
Other	1	0.2%	0	0.0%	0	0.0%	0	0.0%
Underground Equipment Related	0	0.0%	0	0.0%	1	0.2%	0	0.0%
Transmission\Substation Equipment	0	0.0%	1	0.3%	0	0.0%	1	0.3%
Other Alternative Supplier\Utility	0	0.0%	0	0.0%	0	0.0%	0	0.0%
TOTAL (all causes)	509	100.0%	339	100.0%	495	100.0%	310	100.0%

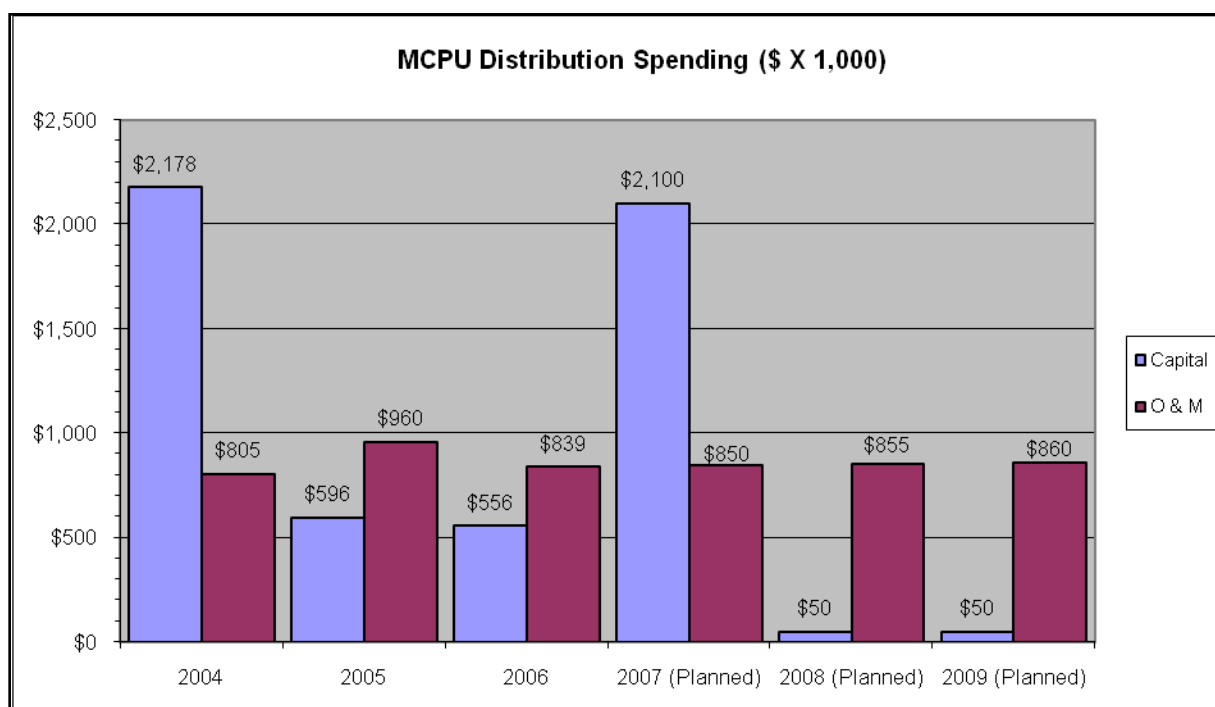
The first three interruption causes listed in this table have accounted for more than 50% of the interruptions on MCPU's system during each of the past four years. MCPU reported approximately 9% of its interruptions in Illinois during 2006 were tree-related, which equates to a similar percentage to tree related interruptions in previous years. MCPU should especially try to reduce the number of interruptions attributed to the more frequently occurring cause categories.

9. Plan to Maintain or Improve Reliability

MCPU's actual and planned spending on distribution during the years 2004 through 2009 is illustrated by Figure 10. MCPU reported it spent within 2% of its budgeted amount on distribution O&M during 2006. MCPU's stated it will budget between \$850 thousand and \$860 thousand each year 2007 through 2009 for distribution O&M, which is consistent with its historical spending. Staff is hopeful that MCPU's relatively flat O&M budget will provide it with adequate funding to improve upon its tree trimming program as well as continue to inspect and maintain facilities on its distribution circuits.

MCPU explained that its investments in a new distribution substation and transmission lines was the main reason for the spike in capital expenditures projected for 2007. MCPU indicated the values it projects for the years 2008 and beyond are expected to become the normal spending level once it completes this large substation project.

Figure 10: MCPU's Distribution Spending (2004-2009)



Once new the transmission lines and substation are completed, MCPU expects to spend approximately \$50,000 each year on transmission O&M, and \$10,000 or less on transmission capital improvements.

10. Potential Reliability Problems and Risks

During inspections in July of 2007, Staff was generally pleased with the observed condition of MCPU's distribution facilities. The most significant reliability risk Staff noted was trees contacting or growing very close to the primary conductor. Staff is concerned about noting more trees close to or contacting MCPU's distribution lines during its 2007 inspections than Staff had noted in 2006. MCPU, meanwhile, spent less than its budgeted amount on tree trimming. MCPU should make sure its tree trimming crews trim all trees growing adjacent to its distribution circuits in such a manner that they will not contact the power lines between trim cycles, or in the alternative, MCPU should return to some locations for mid-cycle trimming.

11. Implementation of the Plan Listed in the Previous Reliability Report

MCPU listed three major on-going system-wide reliability programs within its previous reliability report, and MCPU has indicated it performed work in each of these programs during the 2006 calendar year. Staff agrees that each of these programs, if effectively implemented, will improve reliability on MCPU's system.

- MCPU stated it would continue to install animal protection at new transformer installations and at locations that experience animal related interruptions.

During Staff's inspections in July of 2007, Staff noted that many distribution transformers had animal protection installed. Though Staff also noted many transformers without animal protection, it appeared to Staff that MCPU is making good progress in this area. A continual reduction in animal-related interruptions should occur as MCPU continues this program in future years.

- MCPU stated it would review circuit interruption data to determine if the installation of more sectionalizing devices, or other work, is necessary to improve reliability.

The "other work" includes such things as relocating facilities or placing overhead facilities underground. During Staff's circuit inspections in July of 2007, Staff observed that MCPU was in the process of placing certain line sections in a subdivision that Circuit 31000 supplies underground due to ongoing tree problems. Staff also noted taps off each of the circuits that Staff inspected were nearly always fused. Staff believes MCPU is effectively implemented this part of its plan.

- MCPU stated it would continue to work toward achievement of a three year system wide tree trimming cycle.

MCPU asserted that it had completed trimming trees in all the grids in its operating area within a 3-year period. Staff was encouraged by MCPU's assertion, but was disappointed to find trees contacting and growing close to the primary in several locations when inspecting MCPU's distribution circuits. Now that MCPU has made it through all the grids in the 3-year time frame, Staff encourages MCPU to focus on trimming in such a manner that the trees do not contact the primary conductor between trimming cycles. If MCPU cannot achieve this, then it should schedule mid-cycle trimming for problem trees.

12. Summary of Recommendations

To improve the reliability of the service MCPU provides to its distribution customers, Staff recommends MCPU consider the following:

- MCPU should continue with its efforts to install animal protection on distribution equipment. Animals caused between 10% and 20% of interruption within MCPU's system during each of the last four years. It appeared to Staff that MCPU is doing a good job installing this protection, and Staff simply encourages MCPU to continue its efforts.
- MCPU's tree trimming personnel should clear trees away from the conductor in such a manner that the trees will not grow or blow into the lines prior to being trimmed again. Staff noted several tree contacts when inspecting MCPU's distribution circuits in July of 2007. MCPU's assertion that it trimmed all of the grids in its operating area within three years is a positive step, but MCPU must trim trees in such a manner that the trees do not contact the power lines between cycles.
- MCPU should consider utilizing overhead fault indicators to help identify the location of the causes of interruptions on its distribution circuits where line sections travel cross-country or are not easily seen from the roadway. MCPU's use of these devices could help its personnel locate problems faster, result in shorter overall interruption time, and lower MCPU's CAIDI.

Rockrohr, Greg

From: Rockrohr, Greg
Sent: Thursday, July 26, 2007 3:44 PM
To: @ Bramlet, Eric
Cc: 'lhorral@mtcpu.com'; Stoller, Harry; Buxton, Roy
Subject: Staff's 2007 Distribution Circuit Inspections
Attachments: 2007_MCPU Summary of Field Inspection.xls

On July 17 and 18, with the assistance of Larry Horrall, I inspected three of Mt. Carmel Public Utility Company's ("MCPU") distribution circuits.

I hope that the attached worksheets, which summarize my notes taken during those circuit inspections, are useful to MCPU. The worksheets are not represented as capturing all of the potential reliability problems that may exist on the circuits that I inspected. In many cases, there were portions of the circuits that I did not see. My inspections are not intended to take the place of the thorough, detailed inspections that your company should periodically perform.

Please respond no later than August 24, 2007, regarding the following:

When inspecting Circuit 31000, I noted an apparent National Electric Safety Code ("NESC") violation where MCPU's distribution line crossed railroad tracks (listed in bold font on the attached worksheets). At the time of the inspection, Mr. Horrall indicated that the railroad tracks would soon no longer be in use, as they supplied a mine that was expected to close in the next few weeks. However, it is Staff's position that so long as the tracks are in place, MCPU must satisfy NESC requirements, since it is not known whether or not the railroad tracks will again be used in the future. If MCPU agrees with Staff that a violation of NESC Rule 261D4c exists at the indicated location, please describe MCPU's plans and schedule to eliminate the violation. If MCPU disagrees that a violation of NESC Rule 261D4c exists at the indicated rail crossing, please explain the reasons for MCPU's position, including citations to applicable NESC sections that support that position.

If you have any questions about the information contained in the attached summaries, or my request for a response, please contact me directly.

Thank you,

Greg Rockrohr
Illinois Commerce Commission
217-524-0695

Summary of Distribution Circuit Field Inspection by ICC Staff			
Utility:	Mt. Carmel Public Utility Company	Date:	7/17/07
Circuit:	13000	Inspector:	Rockrohr (ICC)/Horral (MCPU)
Gen. Notes: Central & Western Mt. Carmel. Tree trimming 5/05. MCPU inspected 10/06. A couple trees actually contacting primary. Short circuit all in town -much of it on same poles with Circuit 14000. Mostly residential. Some AG's installed, many trf. without. 2006 Next to worst performing circuit: Weather, OH equipment, & trees. Widespread use of spacer-cable. Facilities in good shape.			
Map No.	Item Description	Photo(s)	Location
2	Tree growing close to primary		Ash S/5th
2	Tree growing close to primary		Alley btw. 5th & 6th -E/ Ash
2	Tree contacting primary		Ash S/6th
2	Tree contacting primary		Alley btw. 4th & 5th -@ end of line E/Elm

Summary of Distribution Circuit Field Inspection by ICC Staff			
Utility:	Mt. Carmel Public Utility Company	Date:	7/17/07
Circuit:	14000	Inspector:	Rockrohr (ICC)/Horral (MCPU)
Gen. Notes: Central & Western Mt. Carmel. Tree trimming 5/05. New growth observed contacting or close to primary at several locations. Short circuit all in town -much of it on same poles with Circuit 13000. Mostly residential. Some AG's installed, many trf. without. 2006 Next to worst performing circuit: Weather, trees and OH equipment. Widespread use of spacer-cable. Facilities in good shape.			
Map No.	Item Description	Photo(s)	Location
1	Tree growing close to primary		1st @ Chestnut
1	Tree growing close to primary		Alley btw. 2nd & 3rd -E/Chestnut
1	Tree growing close to primary		Alley btw. 2nd & 3rd -W/Chestnut
1	Tree growing close to primary		Alley btw. 3rd & 4th -W/Chestnut
2	Tree growing close to primary		5th W/Mulberry (near tie to Circuit 16000)
2	Tree growing close to primary		Alley btw. 9th & 10th -E/Chestnut

Summary of Distribution Circuit Field Inspection by ICC Staff			
Utility:	Mt. Carmel Public Utility Company	Date:	7/17/2007 & 7/18/07
Circuit:	31000	Inspector:	Rockrohr (ICC)/Horral (MCPU)
Gen. Notes: Rural area SW/Mt. Carmel. Last trim 8/06. MCPU inspected 11/06. Several location with vegetation close/contacting pri. Three circuits on same pole line near substation. Longish rural cct. Several line sections not visible from roads. Spotty AG coverage. 2006 Worst performing circuit: 92 interruptions on cct -Weather, OH equipment, & animals most frequent causes. Facilities in good shape.			
Map No.	Item Description	Photo(s)	Location
1	Tree growing close to primary		Pvt. property S/3rd & W/ Vine (Near LS3100T145)
2	Tree growing close to primary		4th & Vine
2	Tree growing close to primary		Alley btw. 4th & 5th -W/Division
2	Vines grown to primary level		Tap to 3-PH trf. -Division S/Southern RR ROW
3	Tree growing close to primary		Lambert Drive -Near primary riser
3	Tree growing close to primary		Wabash Av. -S/Hwy 1
4	Willow tree tips burning on primary		Wabash Av. -W/1020E (LS31120T130)
5	NESC: Single arm with pin insulators @ RR crossing	3	RR crossing btw. Wabash & Hwy 1 (behind 9710 Wabash)
6	Vines grown to primary level		1120N -E/Hwy 1
7	Tree growing close to primary		1100N -E/920E
8	Nut loose on insulator pin		1120N -W/840E
8	Vines grown to primary level		Pvt. property S/1120N (Near end of line LS31100T555)
11	Tree growing close to primary		800E -S/tap to Beal Woods State Park
12	Tree growing close to primary		Tap to S side of 900N -W/ 800 E
14	Bolt coming out of pole top pin		700E -Just N/950N
18	Tree growing close to primary		700E -btw Hwy 15 & 1250N
19	Vines grown to primary level & over trf.	1 & 2	1220 N -E/650 E
20	Tree growing close to primary		650E -N/Hwy 15
21	Tree growing close to primary		Pvt. Lane beyond locked gate 1300N -W/570E
22	Tree growing close to primary		700E -N/Hwy 15
22	Vines grown to primary level		700E -2nd Tap to east N/Hwy 15
25	Tree burning on primary		East leg of Sugar Creek Av. -S/Deerfield Blvd.
26	Tree growing close to primary		870E -S/1250N (LS31230)
27	Tree growing close to primary		Hwy 1 S/1250N @ end of tap (LS31065T064)